

### **REMARKS**

Claim 1 is amended to more particularly point out that an off-line reactor includes an ammonia forming catalyst. The reactor is disposed upstream of, and in downstream fluid communication with the SCR catalyst. An off-line burner is disposed upstream of, and in downstream fluid communication with the off-line reactor and disposed upstream of, and in downstream fluid communication with a reformer. The reformer is disposed upstream of, and in fluid downstream communication with the off-line reactor. These features are described on page 30, lines 3-31, and page 31, lines 1-30, and as shown in Figure 6.

Claims 17, 34, 54, and 62 are canceled.

Claim 24 is amended to call out that a portion of the reformat is disposed intermediate an in-line oxidation catalyst and an in-line particulate filter into an in-line fluid exhaust conduit defined between the engine and the oxidation catalyst and the particulate filter and the NO<sub>x</sub> adsorber and the SCR catalyst. The oxidation catalyst and the particulate filter are disposed upstream of said NO<sub>x</sub> adsorber and said SCR catalyst and are in fluid communication with the said NO<sub>x</sub> adsorber and said SCR catalyst. These features are described on page 30, lines 3-31, and page 31, lines 1-30, and as shown in Figures 5 and 6.

Claim 37 is amended to more particularly point out that fuel is burned off-line to form burner NO<sub>x</sub>, wherein an off-line burner generates an output received by a reformer and generates an output received by a reactor, These features are described on page 30, lines 3-31, and page 31, lines 1-30, and as shown in Figures 5 and 6.

Claim 49 is amended to call out that an output of the reformer is disposed for in-line fluid communication intermediate the engine and an in-line oxidation catalyst and for in-line fluid communication intermediate said in-line oxidation catalyst and an in-line particulate filter and for in-line fluid communication intermediate said in-line particulate filter and said NO<sub>x</sub> adsorber. These features are shown in Figure 5 and 6.

Claims 50 and 52-53 are each amended to clarify the element name "*oxidation catalyst*."

Claim 55 is amended to correct a grammatical error.

New claims 63-71 are provided for consideration by the Examiner.

### **Claim Objection**

Claim 17 has been canceled and is no longer subject to this objection.

**Claim Rejection based on 35 USC § 102**

*Kinugasa et al.*

Claim 1 has been rejected under 35 USC § 102(b). The Examiner stated that this claim is not patentable in view of United States Patent No. 6,109,024, filed by Kinugasa et al.

Claim 1 includes a NO<sub>x</sub> abatement system (600) that includes an off-line burner (38) and an off-line reactor (44). The off-line burner (38) is disposed upstream of, and in downstream fluid communication with the off-line reactor (44) and disposed upstream of, and in downstream fluid communication with a reformer (24), and the reformer (24) is disposed upstream of, and in fluid downstream communication with the off-line reactor (44). These features are described in on page 30, lines 3-31, and page 31, lines 1-30, and as shown in Figure 6. Kinugasa et al. does not disclose a NO<sub>x</sub> abatement system having an off-line burner disposed upstream of, and in downstream fluid communication with a reformer. Thus, Kinugasa et al. does not disclose Applicant's invention as recited in amended base claim 1.

Accordingly, it is respectfully requested that the 35 USC § 102(b) rejection of amended base claim 1 based on Kinugasa et al. be reconsidered and withdrawn, and the claim be allowed.

*Duvinage et al.*

Claims 34 and 62 have been rejected under 35 USC § 102(e). The Examiner stated that these claims are not patentable in view of United States Patent No. 7,254,939, filed by Duvinage et al.

Claims 34 and 62 have been canceled rendering this rejection moot.

**Claim Rejection based on 35 USC § 103**

*Kinugasa et al. in view of Duvinage et al.*

Claims 17, 49, and 54 have been rejected under 35 USC § 103(a). The Examiner stated that these claims are not patentable in view of United States Patent No. 6,109,024, filed by Kinugasa et al. in view of United States Patent No. 7,254,939, file by Duvinage et al.

Claims 17 and 54 have been canceled. Amended claim 49 is dependent on amended claim 1. As previously described herein, Kinugasa et al. does not disclose a NO<sub>x</sub> abatement system having an off-line burner disposed upstream of, and in downstream fluid communication

with a reformer. Duvinage et al. is applied to teach an exhaust gas purification system, as shown in Figure 1. Duvinage et al. does not disclose a NO<sub>x</sub> abatement system having an off-line burner disposed upstream of, and in downstream fluid communication with a reformer. Thus, either individually or in combination with Kinugasa et al., Duvinage et al. does not motivate, teach or suggest Applicants' invention as recited in amended base claim 1, or in amended claim 49 dependent thereon. Moreover, amended claim 49 includes a reformer (24) and an output where the output of the reformer (24) is disposed for in-line fluid communication intermediate an engine (12) and in-line oxidation catalyst (14) and for in-line fluid communication intermediate the in-line oxidation catalyst (14) and an in-line particulate filter (16) and for in-line fluid communication intermediate the in-line particulate filter (16) and a NO<sub>x</sub> adsorber (18), as shown in Figure 6. Kinugasa et al. in view of Duvinage et al. do not include a reformer and an output where the output of the reformer is disposed for in-line fluid communication intermediate an engine and in-line oxidation catalyst and for in-line fluid communication intermediate the in-line oxidation catalyst and an in-line particulate filter and for in-line fluid communication intermediate the in-line particulate filter and a NO<sub>x</sub> adsorber.

Accordingly, it is respectfully requested that the 35 USC § 103(a) rejection of amended claim 49 based on Kinugasa et al. in view of Duvinage et al. be reconsidered and withdrawn, and the claim be allowed.

*Kinugasa et al. in view of Kupe et al.*

Claims 50 and 51 have been rejected under 35 USC § 103(a). The Examiner stated that these claims are not patentable in view of United States Patent No. 6,109,024, filed by Kinugasa et al. in view of United States Patent No. 6,832,473, file by Kupe et al.

Claims 50 and 51 are dependent on amended base claim 1. As previously discussed herein, Kinugasa et al. does not disclose a NO<sub>x</sub> abatement system having an off-line burner disposed upstream of, and in downstream fluid communication with a reformer. Kupe et al. is applied to teach a system (10) for regenerating NO<sub>x</sub> adsorbers and particulate filters, as shown in Figure 2. Kupe et al. does not disclose a NO<sub>x</sub> abatement system having an off-line burner disposed upstream of, and in downstream fluid communication with a reformer. Kupe et al. either individually or in combination with Kinugasa et al. does not disclose Applicants' invention as recited in amended base claim 1, or in claims 50 and 51 dependent thereon. Moreover, claim

50 includes a particulate filter disposed in-line, directly upstream of, and in direct fluid communication with the NO<sub>x</sub> adsorber. Kupe et al. does not disclose a particulate filter disposed in-line, directly upstream of, and in direct fluid communication with the NO<sub>x</sub> adsorber. The term “*direct*” is defined in Applicants’ specification to a communication between a first point and a second point that is uninterrupted by the presence of other reaction devices, as described on page 6, lines 27-31.

Accordingly, it is respectfully requested that the 35 USC § 103(a) rejection of claims 50 and 51 based on Kinugasa et al. in view of Kupe et al. be reconsidered and withdrawn, and the claims be allowed.

*Kinugasa et al. in view of Stroia et al.*

Claims 52 and 53 have been rejected under 35 USC § 103(a). The Examiner stated that these claims are not patentable in view of United States Patent No. 6,109,024, filed by Kinugasa et al. in view of United States Patent No. 6,820,414, file by Stroia et al.

Claims 52 and 53 are dependent on amended base claim 1. As previously discussed herein, Kinugasa et al. does not disclose a NO<sub>x</sub> abatement system having an off-line burner disposed upstream of, and in downstream fluid communication with a reformer. Stroia et al. is applied to teach an after-treatment system including NO<sub>x</sub> adsorbers (26, 28), as shown in Figure 1. Stroia et al. does not disclose a NO<sub>x</sub> abatement system having an off-line burner disposed upstream of, and in downstream fluid communication with a reformer. Stroia et al. either individually or in combination with Kinugasa et al. does not motivate, teach, or suggest Applicants’ invention as described in amended base claim 1, or in claims 52 and 53 dependent thereon.

Accordingly, it is respectfully requested that the 35 USC § 103(a) rejection of claims 52 and 53 based on Kinugasa et al. in view of Stroia et al. be reconsidered and withdrawn, and the claims be allowed.

*Kinugasa et al.*

Claims 55-57 have been rejected under 35 USC § 103(a). The Examiner stated that these claims are not patentable in view of United States Patent No. 6,109,024, filed by Kinugasa et al.

Claims 55-57 are dependent on amended base claim 1. As previously discussed herein, Kinugasa et al. does not disclose a NO<sub>x</sub> abatement system having an off-line burner disposed upstream of, and in downstream fluid communication with a reformer. Thus, Kinugasa et al. does not disclose Applicants' invention as recited in amended base claim 1, or in claims 55-57 dependent thereon.

Accordingly, it is respectfully requested that the 35 USC § 103(a) rejection of claims 55-57 based on Kinugasa et al. be reconsidered and withdrawn, and the claims be allowed.

*Gandhi et al. in view of Duvinage et al.*

Claims 24 and 58-61 have been rejected under 35 USC § 103(a). The Examiner stated that these claims are not patentable in view of United States Patent No. 7,332,135, filed by Gandhi et al. in view of United States Patent No. 7,254,939, filed by Duvinage et al.

Claims 58-61 are dependent on amended base claim 24. Amended base claim 24 recites a method of NO<sub>x</sub> abatement that includes an off-line reactor (44) disposed upstream of, and in fluid communication with said SCR catalyst (20) and an off-line burner (38) and an off-line reformer (24) being disposed upstream of, and in fluid communication with a reactor (44), the burner (38) having an output received by the reformer (24) and an output received by the reactor (44), as described in on page 30, lines 3-31, and page 31, lines 1-30, and as shown in Figures 5 and 6. Gandhi et al. is applied to show a method of NO<sub>x</sub> abatement, as shown in Figure 2. Gandhi does not disclose an off-line reactor disposed upstream of, and in fluid communication with said SCR catalyst and an off-line burner and an off-line reformer being disposed upstream of, and in fluid communication with a reactor, said burner having an output received by the reformer and an output received by the reactor. Duvinage et al. is applied to show a gas purification unit, as shown in Figure 2. As previously disclosed herein, Duvinage et al. does not disclose an off-line reactor disposed upstream of, and in fluid communication with said SCR catalyst and an off-line burner and an off-line reformer being disposed upstream of, and in fluid communication with a reactor, said burner having an output received by the reformer and an output received by the reactor.

Claims 58-61 are dependent on amended base claim 24, and therefore are not taught or suggested by the references at least for the reasons set forth with regard to that claim.

Accordingly, it is respectfully requested that the 35 USC § 103(a) rejection of claims 24 and 58-61 based on Gandhi et al. in view of Duvinage et al. be reconsidered and withdrawn, and the claims be allowed.

*Hammerle et al. in view of Duvinage et al.*

Claim 37 has been rejected under 35 USC § 103(a). The Examiner stated that this claim is not patentable in view of United States Patent No. 6,823,663, filed by Hammerle et al. in view of United States Patent No. 7,254,939, file by Duvinage et al.

Amended base claim 37 recites a method of NO<sub>x</sub> abatement having a step of burning fuel off-line to form burner NO<sub>x</sub> wherein an off-line burner (38) generates an output received by a reformer (24) and generates an output received by a reactor (44), as described in are described on page 30, lines 3-31, and page 31, lines 1-30,, and as shown in Figures 5 and 6. Hammerle et al. is applied to teach a method of NO<sub>x</sub> abatement, as shown in Figure 2A. Hammerle does not disclose a method of NO<sub>x</sub> abatement having a step of burning fuel off-line to form burner NO<sub>x</sub> wherein an off-line burner generates an output received by a reformer and generates an output received by a reactor. Thus, Hammerle does not disclose Applicants' invention as recited in amended base claim 37. Duvinage et al. is applied to teach an exhaust gas purification system. As previously described herein, Duvinage et al. does not disclose a method of NO<sub>x</sub> abatement having a step of burning fuel off-line to form burner NO<sub>x</sub> wherein an off-line burner generates an output received by a reformer and generates an output received by a reactor. Duvinage et al. either individually or in combination with Hammerle et al. does not disclose Applicants' invention as recited in amended base claim 37.

Accordingly, it is respectfully requested that the 35 USC § 103(a) rejection of claim 37 based on Hammerle et al. in view of Duvinage et al. be reconsidered and withdrawn, and the claim be allowed.

### **Presentation of New Claims**

New claims 63-71 are presented for the Examiner's consideration. Claims 63-71 represent additional inventive features that more particularly point out and distinctly claim the subject matter which Applicants regard as their invention. Support for new claims 63-71 are found throughout the specification and in Figures 1-8. More specifically, claims 63-64 more particularly claim the subject matter recited in formerly amended independent claim 34 and dependent claim 62, each now cancelled. Claim 65 recites subject matter as more particularly shown in the embodiment of Figure 2. Claim 66 recites subject matter as more particularly

shown in the embodiment of Figure 3. Claim 67 recites subject matter as more particularly shown in the embodiment of Figure 4. Claims 68-70 recite subject matter as more particularly shown in the embodiment of Figure 6. Claim 71 recites subject matter as more particularly shown in the embodiment of Figure 5.

### **CONCLUSION**

It is believed, in view of the amendments and remarks herein, that all grounds of rejection of the claims have been addressed and overcome, and that all claims are in condition for allowance. If it would further the prosecution of the application, the Examiner is urged to contact the undersigned at the phone number provided.

The Commissioner is hereby authorized to charge any fees associated with this communication and/or credit any overpayments to Delphi Technologies, Inc., Deposit Account No. 50-0831.

Respectfully submitted,

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